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P R O P O S A L

FOR

THE DEVELOPMENT AND EVALUATION OF

HOT DIPPED PLASTIC PACKAGING

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HOT DIPPED PLASTIC PACKAGING

Introduction

The concept of using hot dipped plastic protection for packaged items which may be stored for long periods of time under any one of a number of conditions appears to be worthy of thorough investigation. Hot dip protection such as that defined under JAN-C-149, Type II, appears suitable as a protective barrier against moisture for the storage of items over long periods of time even where this storage consists of burial in the ground.

Available information in the general field of military packaging indicates the general suitability of these hot dip materials as protective barriers on machine parts and other hardware for the conditions of storage anticipated. However, little or no information is available as to the suitability of this technique when applied to the particular items and packages to be considered in this study. As the components of these items are known to be heat sensitive, it is essential that the temperature exposure to which these materials would be subjected during the dipping and curing operation, be determined. The information obtained by these measurements can then be compared with the known characteristics of the material being packaged to determine if the package wall has sufficient insulating value to protect the packaged device from deleterious heat effects during hot dipping and curing.

Scope

The proposed work program is divided into six phases as follows:

Phase I

The experimental determination of the temperature and time duration of exposure to which the packaged item would be subjected when packed in its standard package and dipped by the accepted hot dip procedure.

The items to be tested under this program would consist of:

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a) R. R. Signal Device
b) Plastic Explosives C-3 and C-4
c) Primacord and Black Powder Time Fuze
d) Pull-Type Fuze Lighters
e) Pocket Incendiary Units
f) Thermit Well Units
g) Rocket Incendiary Adapters, 2.36" and 3.50"
h) Mark I and/~~or~~ Mark II Pencil Units
i) AC Delay Packages
j) Fuzee Matches
k) Incendiary Head

In addition to the study covering the normal dipping operation, an investigation of the rate of temperature rise and the maximum temperature reached inside the package will be made over a more extended dip time. This study will provide the information needed to establish the safety of the operation for packages containing "hot" materials. The time interval must be great enough to cover the maximum time required for recovery and removal of packages lost and/or wedged in the dip tank. THIS INFORMATION PERTAINING TO COOK-OFF TIME WILL BE CONFIRMED BY ACTUAL FIELD TESTS COVERING A 80 MINUTE TEST PERIOD.

Phase II

From the data obtained in Phase I, and information contained in the literature on the items under test, establish whether or not the standard package for each of these items provides sufficient protection against thermal damage during the application of the hot dip to establish the feasibility of the use of this process for the particular packaged items.

Phase III

For those items whose package does not provide sufficient thermal protection, develop packages which suitably protect the device during the application of hot dip production.

Phase IV

Prepare hot dipped plastic coatings of the packaged items and place them in storage for later evaluation.

The detailed storage conditions to which these packaged and protected items will be subjected, will be established by agreement between the contractor and the client's representative.

Phase V

Functional testing of the units, prepared and stored under Phase IV above, at the conclusion of the shortest storage interval.

Phase VI

Evaluation of data, preparation of final report and preparation of instruction manual for the protection of packaged devices by hot dipping.

Under Phase I, it is anticipated that mock-ups of the items to be considered will be packaged in their standard packing into which will be inserted thermal couples in order to measure the temperature exposure of the item during hot dipping. From this can be determined not only the temperature to which the sensitive portion of the item will be exposed, but also the duriation of that exposure. In cases where lack of information makes it impossible to establish the safety of this dipping procedure, it may be necessary to simulate this exposure of the material to determine its ability to withstand this temperature-time function.

On the basis of this study, it should be possible, under Phase II, to determine whether or not the packages as now used are satisfactory protection for the items packed within. Where the present standard package does not provide a reasonable margin of safety, a new package will be designed for the item to provide the necessary protection. This package, of course, will be tested by the same procedure used to establish the adequacy or inadequacy of the standard package.

As soon as an adequate package is established for each item, sample packages of this item will be hot dipped to provide the necessary storage samples. It is contemplated that this dipping will take place in equipment now available at [redacted] It is further anticipated that the storage and evaluation of these items will be conducted at the same installation. 25X1

The attached cost estimate is based on a research and development effort covering a period of 9 months. Materials costs contained in the cost estimate are based on the assumption that the client will supply, without charge, the required number of packaged items of each device for tests and evaluation.

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COST ESTIMATE

Materials	$ 300.00
Test Equipment	750.00
Travel and Miscellaneous	500.00
750 Engineering Hours @$3.50	2,625.00
1,500 Engineering Hours @$2.50	3,750.00
Engineering Burden,	25X1
Sub Total	25X1
TOTAL	$12,000.00

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